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1. Scope

This document describes requirements for the following:

- a. Distribution source files for review and distribution copies of books produced under NLS contracts
- b. Review copies from distribution source files of books produced under NLS contracts
- c. Qualification of blank recordable compact discs used to produce review copies

2. Reference Documents

The following documents and publications, of the issue in effect on the date of the invitation for bids, form a part of this specification. In the event of conflict between the publications referenced herein and the content of this specification, the content of this specification shall be considered a superseding requirement.

2.1 American National Standards Institute (ANSI)

Z1.4

Sampling Procedures and Tables for Inspection by Attributes

The document cited above is available from:

American National Standards Institute, Inc.

11 West 42nd Street

New York, NY 10036

2.2 International Standards Organization (ISO)

ISO 9660

Information processing -- Volume and file structure of CD-ROM for information interchange

ISO/IEC 13490-2

Information technology -- Volume and file structure of read-only and write-once compact disk media for information interchange

Part 2: Volume and file structure

(This publication is also referred to as the Orange Book.)

The documents cited above are available from:
Global Engineering Documents
15 Inverness Way East
Englewood, CO 80112

2.3 National Library Service for the Blind and Physically Handicapped

NLS Specification 300
Book Mastering

The document cited above is available from:
National Library Service for the Blind and Physically Handicapped
Library of Congress
Washington, DC 20542

2.4 Definitions of Terms

The information interchange terms used in this document are defined in ISO publications 9660 and ISO/IEC 13490-2. The following terms are not defined in the ISO publications cited above, but are applicable to this document.

- a. Distribution source file (DSF) -- The digital audio file, or files, of a complete book that has been narrated and recorded in the NLS designated style and is the source of all review copies and all distribution copies.
- b. Review copy -- The composite of all review files needed to make a complete book.
- c. Review file -- A file copied from the distribution source file to a recordable compact disc. Each review file represents one complete side of an NLS standard 4 track, 15/16 ips cassette book.
- d. WAV file -- A linear PCM file. The WAV file reference is: Waveform - Audio File Format, "Multimedia Programming Interface and Data Specification v1.0" as issued by IBM and Microsoft, 1991. The web address for this reference is
<<http://www.cwi.nl/ftp/audio/RIFF-format>>

3. Requirements

3.1 Conformance with NLS Specification 300

Each review file shall conform with applicable requirements cited in NLS specification 300.

3.2 Conversion from Analog Prohibited

Conversion of analog recordings to digital format under this specification is not permitted.

3.3 Technical

3.3.1 The Disc on which the Review File is copied

Each review file shall be copied on a new blank recordable compact disc (CD-R). Rewritable compact discs (CD-RW) are not acceptable. Each recordable compact disc shall be a 650 megabyte disc that is manufactured with the following properties:

- a. A maximum disc eccentricity not greater than plus or minus 50 microns
- b. Silver or gold reflective layer
- c. Phthalocyanine dye
- d. An opaque surface

3.3.2 Technical Characteristics of Review Files

3.3.2.1 Producing the Review Copy

- a. There shall be no sample rate conversion, data compression, or alteration of any kind when the review copy is copied from the distribution source file.
- b. Writing to the CD-R must be a single session recording procedure according to ISO 9660 level 1 standard.
- c. Overburned or fixated-for-append discs are not acceptable.

3.3.2.2 Review File Configuration

- a. Each review file shall be written to a CD-R as linear PCM data in WAV file format.
- b. Each review file shall be written at a sample rate of 44.1 kHz or 22.05 kHz, 16 bits per sample, with dither, block alignment = 2.
- c. Each CD-R shall contain only one review file.

3.3.2.3 Review File Duration

The duration of each review file shall conform to applicable requirements cited in NLS specification 300.

3.3.2.4 Review Copy Signal Level for the Spoken Text

The average signal level for the spoken text in the review copy shall be not less than -16 dBFS, nor greater than -12 dBFS.

3.3.2.5 Review Copy Signal Level for Index Tones

The signal level for all index tones (see NLS specification 300) in the review copy shall be -26 dBFS, plus or minus 2 dB.

3.3.2.6 Background Noise Level in the Review Copy

The background noise level in the review copy shall not exceed -72 dBFS, A-weighted. Background noise includes both acoustical and electrical noise.

3.3.2.7 Date and Time Stamp for the Review Copy

Each file in the distribution source file shall have a date and time stamp that shows when each file was finalized to produce the review copy for submission to NLS. The stamp shall have month, day, year, and time in the format of mm-dd-yyyy and time in 24-hour clock time. If a review file requires correction, the distribution source file from which it came shall be corrected and the new version shall carry the date and time stamp of when the corrected file was finalized to produce the review file for resubmission to NLS.

3.3.3 Error Rate in Review Copies

All review copies must be free from errors that prevent the information from being read. Each review copy submitted to NLS must meet or exceed the following requirements for errors per disc:

- a. E11 -- maximum of 200
- b. E12 -- maximum of 300
- c. E21 -- maximum of 200
- d. E22 -- unacceptable
- e. E31 -- maximum of 200
- f. E32 -- unacceptable
- g. BLER -- maximum of 200
- h. BURST -- maximum of 5
- i. Jitter -- shall be less than 35 nanoseconds

4. Quality Assurance Provisions

4.1 Classification of Inspections

The inspection requirements specified herein are classified as follows:

- a. Qualification Inspection -- see section 4.4
- b. Incoming Inspection -- see section 4.5
- c. Contractor's Acceptance Inspection -- see section 4.6.1
- d. NLS Acceptance Inspection -- see section 4.6.2

4.2 Responsibility for Inspection

The contractor is responsible for the performance of all inspection requirements specified herein. NLS reserves the right to perform any of the inspections set forth in this specification when deemed necessary to ensure that products conform to the prescribed requirements.

4.2.1 Test Equipment and Inspection Facilities

The contractor shall ensure that test and inspection facilities of sufficient accuracy, quality, and quantity are established and maintained to permit performance of required inspections. Test equipment shall be calibrated annually.

4.2.2 Responsibility for Compliance

All items must meet all requirements of sections 3 and 5. The inspections set forth in this specification shall become a part of the contractor's overall inspection system or quality program. The absence of any inspection requirements in the specification shall not relieve the contractor of the responsibility of assuring that all products or supplies submitted to NLS for acceptance comply with all requirements of the contract. Sampling in quality conformance does not authorize the submission of known defective material, either indicated or actual, nor does it commit NLS to acceptance of defective material. Should NLS determine that a significant fault or faults are found in production units within the warranty period, then correction of the fault or faults and production inspections or controls for prevention shall be instituted without additional charge to NLS.

4.2.3 Reporting of Test Results

The contractor shall maintain complete records of all inspection results for the duration of the contract. Copies of these inspection records (in English) shall be provided with each shipment. The records shall include the information necessary to identify the lot, the lot sample, the testing equipment, the inspector, and the date of the test.

4.3 Inspection Conditions

Sampling for inspections shall be performed in accordance with ANSI Z1.4.

4.4 Qualification Inspection

Qualification inspection shall be performed on new products and on previously qualified products that have undergone any changes in materials or manufacturing process. All proposed changes shall be reported to the NLS contracting officer in writing, with a statement by the contractor describing the changes and the impact of the changes on the delivered product. NLS reserves the right to require six weeks for the evaluation of qualification samples prior to delivery of products incorporating the changes. The foregoing requirement does not relieve the contractor of any other requirements of this

specification or the contract.

4.4.1 Samples and Inspection

The qualification samples shall consist of:

- a. Eight recorded and tested CD-Rs
- b. Record of test results
- c. Eight blank CD-Rs
- d. CD-R manufacturer's data sheet
- e. Quality procedures

4.4.1.1 Recorded Samples

The contractor shall produce eight recorded sample CD-Rs by writing a full-length review file from a distribution source file to a blank CD-R. A full-length review file shall have a duration of not less than 87 minutes nor more than 88 minutes, and shall contain at least one index tone. The DSF shall not be produced by analog-to-digital conversion.

4.4.1.2 Blank Samples

The contractor shall submit eight blank CD-Rs from the same lot as the recorded samples. NLS will inspect these samples for conformance to all requirements of section 3.3.3.

4.4.1.3 Manufacturer's Data

The contractor shall submit manufacturer's published technical data for the CD-R to be qualified. The data shall demonstrate conformance with the requirements of section 3.3.1.

4.4.1.4 Quality Procedures

The contractor shall prepare a written document that describes the quality assurance procedures used to achieve the requirements of this specification. The contractor shall submit this document to the NLS Quality Assurance Section at the beginning of each new contract and at any other time required by NLS. NLS reserves the right to require the contractor to improve quality assurance procedures.

4.4.1.5 Waiver of Qualification Inspection

When the contractor uses NLS qualified products, NLS may waive the qualification inspection requirements.

4.4.2 Inspection

4.4.2.1 Contractor's Inspection

Qualification inspection shall be performed by the contractor on each recorded sample and shall consist of the inspections listed in table I. A signed and dated written record of the inspection results shall be submitted with the qualification samples.

4.4.2.2 NLS Inspection

Qualification inspection will be performed by NLS on each recorded sample and will consist of the inspections listed in table I.

Table I. EXAMINATIONS, MEASUREMENTS, AND TESTS
QUALIFICATION INSPECTION

Requirement	Section	Test Method
All applicable requirements of specification 300	3.1	NLS review
Disc properties	3.3.1	4.7.3.7
Review copy properties	3.3.2.1	4.7.3.1
Review file configuration	3.2.2.2	4.7.3.2
Review file duration	3.2.2.3	4.7.3.3
Signal level - text	3.3.2.4	4.7.3.4.2
Signal level - tone	3.3.2.5	4.7.3.4.3
Background noise level	3.3.2.6	4.7.3.4.4
Date and time stamp	3.3.2.7	4.7.3.5
Error rate	3.3.3	4.7.3.6
Packaging	5.1	NLS review
Labeling	5.2	NLS review

4.5 Incoming Inspection

Incoming inspection shall be performed by the contractor on each lot of CD-Rs.

4.5.1 Sample

The incoming inspection sample shall be chosen at random in accordance with ANSI Z1.4 inspection level II for an AQL of 0.65%.

4.5.2 Inspection

4.5.2.1 Error Rate

The contractor shall inspect the incoming inspection sample of CD-Rs for conformance to the requirements of section 3.3.3 using the test method of section 4.7.3.6.

4.6 Acceptance Inspection

4.6.1 Contractor's Acceptance Inspection

Acceptance inspection shall be performed by the contractor on 100% of every review copy and shall consist of the inspections listed in table II.

4.6.2 NLS Acceptance inspection

Acceptance inspection will be performed by NLS on every review copy and will consist of the inspections listed in table II.

Table II - ACCEPTANCE INSPECTION

Requirement	Section	Test Method
All applicable requirements of specification 300	3.1	NLS review
Review copy properties	3.3.2.1	4.7.3.1
Review file configuration	3.2.2.2	4.7.3.2
Signal level - text	3.3.2.4	4.7.3.4.2
Signal level - tone	3.3.2.5	4.7.3.4.3
Background noise level	3.3.2.6	4.7.3.4.4
Date and time stamp	3.3.2.7	4.7.3.5
Packaging	5.1	NLS review
Labeling	5.2	NLS review

4.7 Methods of Inspection

4.7.1 Test Environment

Unless otherwise specified, all measurements and tests shall be performed at an ambient temperature of 23 degrees C +/-5 degrees C (73.4 degrees F +/- 9 degrees F) and a relative humidity of between 40% and 70%.

4.7.2 Preliminary Conditioning

Test units shall be subjected to the test environment of 4.7.1 for a period of not less than 24 hours prior to performance of any measurement or test.

4.7.3 Test Methods

4.7.3.1 Review Copy

Test with CDA 2000 Analyzer, or equivalent, for conformance to the requirements of 3.3.2.1, part b and 3.3.2.1, part c.

4.7.3.2 Review File Configuration

Examine with Sound Forge editor, or equivalent, for conformance with the requirements of 3.3.2.2.

4.7.3.3 Review File Duration

Examine with Sound Forge editor, or equivalent, for conformance with the requirements of 3.3.2.3.

4.7.3.4 Signal Levels

4.7.3.4.1 Setup and Calibration

Measure levels from WAV files by connecting an RMS voltmeter to the output of a PC sound card and playing the file using the Sound Forge editor or equivalent. Calibrate the voltmeter to 0 dBFS using a WAV file containing a full-scale 1000 Hertz sine wave. A full-scale sine wave has maximum values of 32767 and minimum values of -32767 and can be produced by generating a pure sine wave with 0 dBFS amplitude or by normalizing a lower amplitude sine wave. A sound card whose output noise with no signal present is not less than -75 dBFS A-weighted shall not be acceptable. A low pass filter with cutoff frequency of approximately 75 Hertz could be used to measure the index tones more easily.

4.7.3.4.2 Spoken text

Play a section of the review file and measure the unweighted voltage in dBFS for conformance to the requirement of 3.3.2.4.

4.7.3.4.3 Index Tones

Using the Sound Forge editor, or equivalent, select a section of the review file between words that contain an index tone. Play the selection as a loop and measure the unweighted voltage in dBFS for conformance to the requirement of 3.3.2.5.

4.7.3.4.4 Background Noise

Using the Sound Forge editor, or equivalent, select a quiet section of the review file between words at least one second long. Connect an A-weighting filter between the sound card and the voltmeter, play the selection as a loop and measure the noise for conformance to the requirement of 3.3.2.6.

4.7.3.5 Date and Time Stamp

Inspect the label visually for conformance to requirements cited in section 3.3.2.7.

4.7.3.6 Error Rate

Test with CDA 2000 Analyzer or equivalent for conformance to the requirements of 3.3.3.

4.7.3.7 Disc Properties

Examine manufacturer's published technical data for conformance to the requirements of 3.3.1.

4.8 Warranty

The contractor shall provide a full unconditional warranty that the review copy conforms to requirements set forth in section 3.3.3 for a full calendar year. The warranty period shall begin on the date of review copy approval by the NLS Quality Assurance Section.

5. Labeling and Packaging

5.1 The Box for Storing Review Discs

- a. Each review copy shall be enclosed in a disc storage box provided by NLS.
- b. Only one disc shall be put in a sleeve. Each disc shall be positioned in a sleeve so that when the flap is folded down the disc label shall be facing the flap and the disc shall be fully covered.

For drawing that shows example disc orientation in a sleeve, see figure 1.

5.2 Labeling

5.2.1 Label on the Disc

Discs may be labeled with a paper label, or by ink-jet or thermal printing directly on the disc. All discs in a review copy must be labeled with the same labeling process.

5.2.1.1 Paper Label

When paper labels are used, the labels shall be of white stock and conform to the following:

- a. Each label shall be a circular label that has a center cutout. The diameter of the label shall be a nominal 116 millimeters and the diameter of the center cutout shall be a nominal 46 millimeters.
- b. The label may not interfere with disc playback in any manner.
- c. The label shall not be distorted, off center, or misaligned.
- d. The label must adhere firmly and uniformly to the label area without any bubbling, slipping, or peeling.

5.2.1.2 Label Information

The print for each label, paper or ink-jet, or thermal, shall be 14-point Times New Roman in black ink. No writing with any type of marking pen is permitted on either the disc or paper label. The label shall contain the following information as shown in figure 3.

- a. Book number (e.g., RC12345)
- b. Book title
- c. Date and time stamp -- see section 3.3.2.7
- d. Disc number of total number of discs in book (e.g., 1 of 5)
- e. Producer code as used on NLS production authorization record
- f. File name with extension. The file name shall consist of the book number plus the letter "s" and the two-digit number of the side (e.g., 12345s01.WAV).

For drawing that shows example label print information, see figure 3.

5.2.2 Label on the Disc Storage Box

The label shall be white card stock, 67 pound minimum, with dimensions of 5 by 8 inches. The label shall be positioned behind the clear plastic overlay of the box so that it covers the face of the box and the holes in the spine of the box. The printing on each label shall be 14-point Times New Roman in black ink. The label shall list the following:

- a. Book number (e.g., RC12345)
- b. Book title
- c. Range of discs in box and total number of discs in book (e.g., 1-9 of 9, 1-10 of 20, 11-20 of 20)
- d. Box number of total number of boxes in book (e.g., Box 1 of 4)
- e. Producer code as used on NLS production authorization record

For drawing that shows example label layout and label position on a disc storage box, see figure 2.

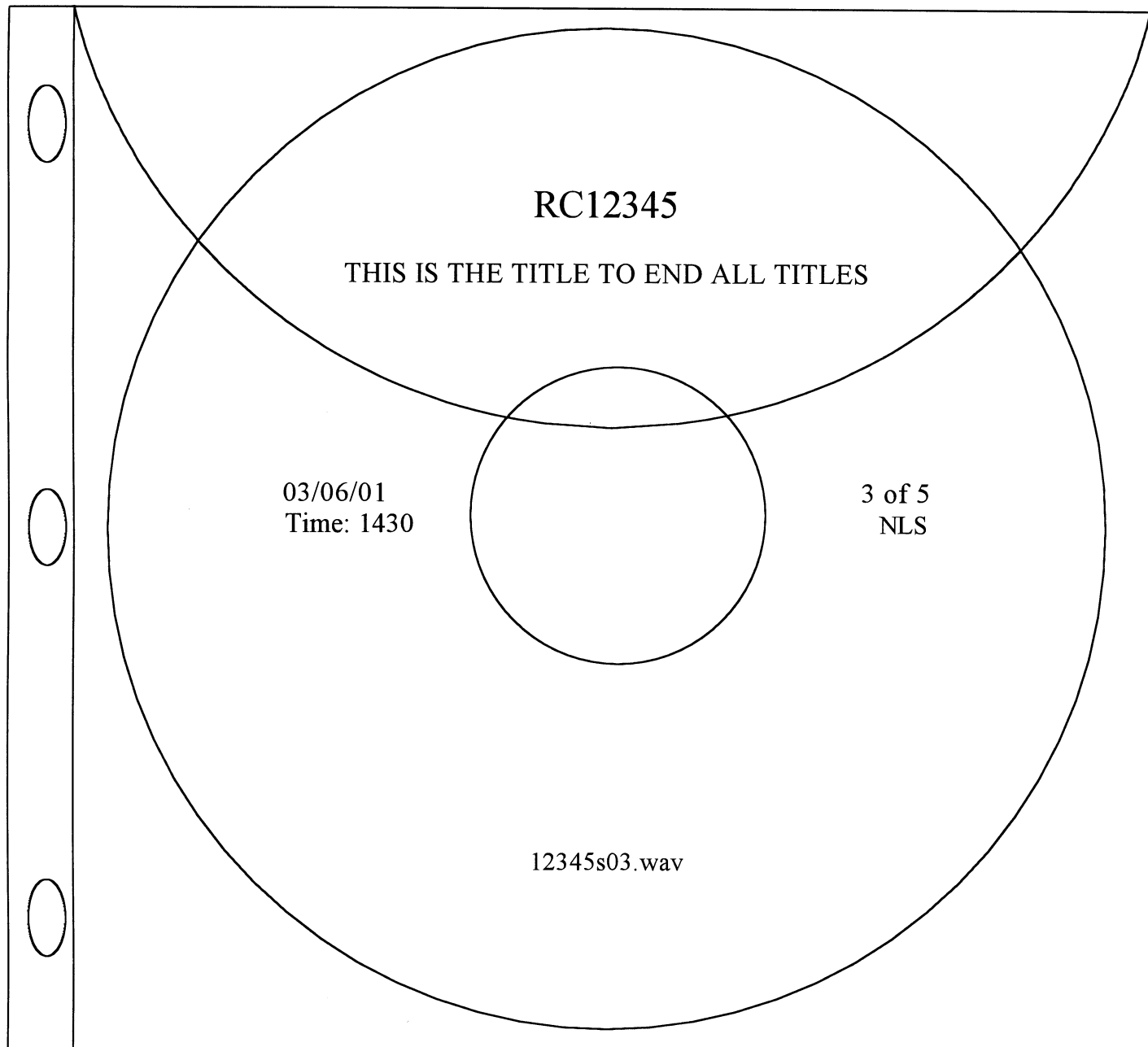
5.3 Packaging Review Copies for Shipment to NLS

Review copies must be packaged for shipment to NLS in a manner that will provide a high degree of protection during shipment.

6. Notes:

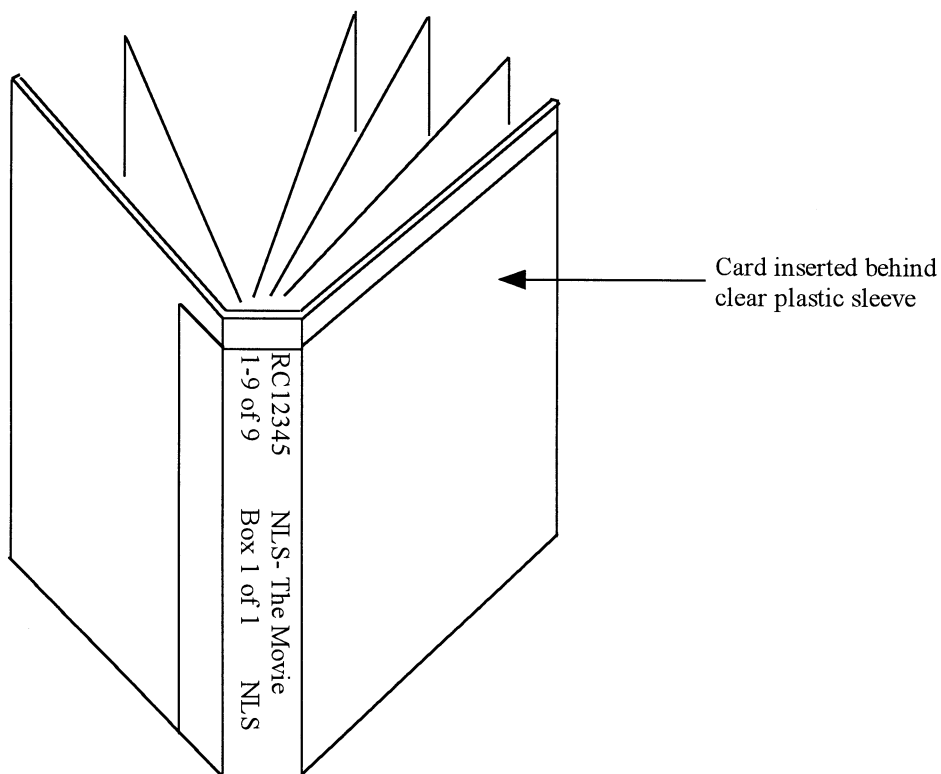
6.1 The CDA 2000 analyzer may be obtained from:

CD Associates
15-A Marconi
Irvine, CA 92618
(949) 588-3805



Disc Orientation

Figure 1



RC12345 1-9 of 9	NLS- The Movie Box 1 of 1	NLS
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Spine Information Layout

Label Layout and Position

Figure 2



Label Information

Figure 3